DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-002612
Date Inspected: 04-May-2008

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 630
OSM Departure Time: 1530
Location: Shanghai, China

CWI Name:	See below	**CWI Present:**	☑ Yes ☐ No
Inspected CWI report:	☐ Yes ☑ No ☐ N/A	**Rod Oven in Use:**	☑ Yes ☐ No ☐ N/A
Electrode to specification:	☑ Yes ☐ No ☐ N/A	**Weld Procedures Followed:**	☑ Yes ☐ No ☐ N/A
Qualified Welders:	☑ Yes ☐ No ☐ N/A	**Verified Joint Fit-up:**	☐ Yes ☑ No ☐ N/A
Approved Drawings:	☑ Yes ☐ No ☐ N/A	**Approved WPS:**	☑ Yes ☐ No ☐ N/A
		Delayed / Cancelled:	☐ Yes ☑ No ☐ N/A

Bridge No: 34-0006
Component: OBG/Tower

Summary of Items Observed:

Caltrans Quality Assurance (QA) Inspector Sherri Brannon arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China to periodically monitor welding and Quality Control (QC) functions. While on site the QA Inspector observed and/or discovered the following.

OBG Assembly
Bay 2 - OBG Assembly:
QA Inspector Brannon randomly observed ZPMC welder Mr. Wang Ming ID #048296 welding fill/cover passes joining SP24A to SP32A for Segment 020A-002. Mr. Wang was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand EM12K, class JW3, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Chen Chih Ming verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Chen Chih Ming to be: preheat temperature of 128°C and welding parameters amps of 635, volts of 32.5, and a travel speed of 545. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-223(2)-1T.

Bay 2 - OBG Assembly:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various side/bottom plates. Cause for heat straightening welding distortion. Heat Straightening is performed by flame straightening using oxygen acetylene with a hand torch.

OBG/Tower Sub-Assembly

Bay 2 - 77 & 144 Meter Mock-up:

QA Inspector Brannon observed tower mock-up to be idle during this shift. QA Inspector Brannon also, randomly observed ZPMC personnel CNC torch cutting with 75% natural gas and 25% oxygen for interior splice plate for various tower elevations.

Bay 3-OBG W shape beams (splice)

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Li Meng Qian ID#054460 splice welding W shape beams. Mr. Li was observed welding in the 3G (vertical) position utilizing a flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic. QA Inspector Brannon observed the ZPMC QC Inspector Mr. Wu Ming Kai verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector Brannon observed preheat and welding parameters measured by the QC CWI Inspector Mr. Wu Ming Kai to be: a minimum preheat temperature of 25°C and welding parameters amps of 201, volts of 25.6, a travel speed of 116 mm/min and a gas flow of 19L. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2233-BU2-F.

Bay 3-OBG side panels (splice)

QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Wu Zhi Bin ID #048904 splice welding joining SP123-001-049, pl 523A to pl 523B. Mr. Wu was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand EM12K, class JW3, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Hu Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Hu Wei Qing to be: preheat temperature of 78°C and welding parameters amps of 509, volts of 31.5, and a travel speed of 428. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2221-B-L2c-S-1.

Bay 3-OBG side/bottom/edge panels:

QA Inspector Brannon randomly observed ZPMC qualified welders, tack welding various T stiffeners plate utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018, class TL508 non-FCM and filler metal brand E7018, class THJ506Fe-1 for FCM material . Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112 and WPS-B-P-2112-FCM respectively.

Bay 4 – Heat straightening side panel:

QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various side/bottom/edge panels and tower diaphragm plates. Side/bottom/edge panels cause for heat straightening welding distortion and tower diaphragm pates cause for heat straightening mill induced. Heat Straightening is performed by flame straightening using oxygen acetylene or natural gas using a hand torch.

Bay 4 Tower 43 Meter Elevation:

QA Inspector Brannon randomly observed ZPMC welder Mr. Jiang Jing Teng ID #046830 groove welding fill/cover pass's joining SA268 (W) to P590 (W) weld joint # WSD1 SA268 -16A. Mrs. Gu was observed welding

in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand LA-85, class ENi5, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Zhao Chen Sun verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Zhao Chen Sun to be: preheat temperature of 180°C and welding parameters amps of 625, volts of 30.3, and a travel speed of 493 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1.

Bay 4 Tower 23 Meter Elevation:
QA Inspector Brannon randomly observed ZPMC welder Mrs. Gu Cai Hong ID #053748 groove welding fill/cover pass's joining SA27 (N) to P546 (N) weld joint # NSD1 SA27 - 1A. Mrs. Gu was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand LA-85, class ENi5, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Zhao Chen Sun verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Zhao Chen Sun to be: preheat temperature of 180°C and welding parameters amps of 630, volts of 30.5, and a travel speed of 500 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1.

Bay 4 – Heat straightening:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various side/bottom panels and tower diaphragm flange plates. Side and bottom panels cause for heat straightening, welding distortion and tower diaphragm plates cause for heat straightening mill induced distortion. Heat Straightening is performed by flame straightening using natural gas or oxygen acetylene using a hand torch.

Bay 7-OBG - Floor Beam Sub Assembly:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various floor beam plates. Cause for heat straightening welding distortion. Heat Straightening is performed by flame straightening using oxygen acetylene with hand torch.

Bay 7-OBG floor beam panels:
QA Inspector Brannon randomly observed ZPMC qualified welders, tack welding various floor beam web splice connections utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018, class TL508. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112.

Bay 7-OBG - Floor Beam Sub Assembly:
QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Sun Gu Zuo ID #058100 groove welding joining floor beam web splice at FB024-001-081. Mr. Sun was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand EM12K, class JW3, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Hu Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Hu Wei Qing to be: preheat temperature of 86°C and welding parameters amps of 496, volts of 30.1, and a travel speed of 428. Welding

parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2221-B-L2c-S-1.

Bay 7 – Floor Beams:
ZPMC NDT (UT):
QA Inspector Brannon randomly observed ZPMC Ultrasonic Testing Technician's Mr. Xue Hai Yong and Mr. Ma Ji Long performing lamination scan with 2.5mhz transducer and performing shear wave using a 70° transducer on the following floor beam web splice welds: FB015-006-023 (accept), FB015-005-023 (accept), FB015-007-023 (accept), FB016-014-021 (accept), FB012-005-023 (accept), FB012-004-023 (accept), FB015-012-023 (accept) and FB015-011-023 (accept). QA Inspector Brannon observed accept marked on the floor beam plates.

Bay 8 – 38 Meter Tower Diaphragm Sub Assembly:
QA Inspector Brannon randomly observed ZPMC qualified welder Mrs. Xi Pei Pei ID #048431 groove welding fill pass's joining SA126 (W) to P257 (W) weld joint WSD1 SA290-11B/12B. Mrs. Xi was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand LA-85, class ENi5 machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Lv Li Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector Zhi Sha observed preheat and welding parameters measured by the QC CWI Inspector Zhi Sha to be: preheat temperature of 180°C and welding parameters amps of 604, volts of 30.5, and a travel speed of 477 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1.

Bay 8 – 18 Meter Tower Diaphragm Sub Assembly:
QA Inspector Brannon randomly observed ZPMC qualified welder Mrs. Ma Ying ID #045270 groove welding joining SA311 (N) to P52 (N) weld joint NSD1 SA311-1A/2A. Mrs. Ma was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand LA-85, class ENi5, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Zhi Sha verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Zhi Sha to be: preheat temperature of 180°C and welding parameters amps of 602, volts of 30.2, and a travel speed of 475 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1

Bay 8 – Heat straightening:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various tower diaphragm flange plates and tower diaphragm plates. Tower diaphragm plates and flanges cause for heat straightening mill induced distortion. Heat Straightening is performed by flame straightening using natural gas with a hand torch.

The following digital photograph below illustrates observation of the activities being performed.

WELDING INSPECTION REPORT

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Summary of Conversations:

No relevant conversations to report.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

Inspected By:	Brannon,Sherri	Quality Assurance Inspector
Reviewed By:	Carreon,Albert	QA Reviewer